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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/082,714	02/25/2002	Robert W. Henkens	4320-0018DIV.	5829

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Atten. Gregory A Nelson
Akerman Senterfitt
Suite 400
222 Lakeview Avenue P O Box 3188
West Palm Beach, FL 33402-3188

EXAMINER	
RILEY, JEZIA	

ART UNIT	PAPER NUMBER
1637	

DATE MAILED: 10/20/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/082,714	HENKENS ET AL.	
	Examiner	Art Unit	
	Jezia Riley	1637	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 August 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-21* is/are pending in the application.

4a) Of the above claim(s) *17-21* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-16* is/are rejected.

7)☒ Claim(s) *12,13,15 and 16* is/are objected to.

8)☒ Claim(s) *1-21* are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. Applicant's election without traverse of Group I (claims 1-16) in the reply filed on 8/20/04 is acknowledged.

Claim Objections

2. Claims 4, 12, 13, 15 and 16 are objected to because of the following informalities: claims 12 and 15 are identical and claims 13 and 16 are identical also. Additionally, the word "amperometic" is misspelled in claim 4 line 2. Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 4-6 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

4. Claim 4 recites the limitation "wherein the amperometric monitor" in line 1. There is insufficient antecedent basis for this limitation in the claim. Claim 1 is claiming a monitor for measuring current produced when an electric potential is applied. There is no indication that said monitor is measuring amperes or potential. Said measurement is viewed to be either a qualitative measurement or

a quantitative measurement. Claim 4 is stating, "wherein **the** amperometric monitor" assuming that said monitor is providing quantitative monitoring only.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 1-12, 14, 15 are rejected under 35 U.S.C. 102(e) as being anticipated by Wohlstadter et al. (Pub. No.: US 2004/00864233 A1).

Wohlstadter et al. discloses materials and methods for producing patterned multi-array, multi-specific surfaces (PMAMS) for use in diagnostics. Wohlstadter provides for electrochemiluminescence methods for detecting or measuring an analyte of interest; novel electrodes for ECL assays; materials and methods for the chemical and/or physical control of conducting domains and reagent deposition for use multiply specific testing procedures. Kits are also provided comprising components including cassettes suitable for simultaneously measuring a plurality of electrochemiluminescence reactions, support surfaces and upon which a plurality of domains are immobilized assay, media for conduct of the ECL assay conducting chemical reactions.

The reference relates to a cassette for conducting ECL reactions and assays comprising one or more binding domains immobilized on a support. The support may act as an electrode for generating electrochemiluminescence. Alternatively, one or more electrodes may be on additional supports, and said electrodes may be brought into proximity to the first support so as to generate ECL. The cassette may have one or more electrodes or one or more electrode/counterelectrode pairs. The cassette may also comprise a second support capable of being placed adjacent to the first support to provide sample containing means therebetween, and/or serve as an electrode. The binding domains are patterned on a support surface and are prepared so as to bind analytes or reagents of interest. ECL assay methods are disclosed for detecting or measuring an analyte of interest, comprising (a) contacting one or more binding domains immobilized on an electrode, in which said contacting is with a sample comprising molecules leveled to an ECL label, (b) applying a voltage waveform effective to trigger ECL at said binding domains, which is viewed to be inclusive of instant claim 7, and (c) measuring or detecting ECL. (Pages 2, 6-7, 14).

Advantageously, a computer controlled voltage source may be used. A computer controlled voltage source is one that can be addressed by a computer to select a particular electrical potential to be supplied. Alternatively it can be programmed to sequentially apply a particular range of electrical potentials over a predetermined time. In such a system, address lines electrically connected to the computer and the voltage source would allow the computer to program the voltage source to produce the particular electrical potential to be applied to the

electrode pair to be energized. (Page 15). Further, in one embodiment, and simply by way of example, the signal processing means comprises a digital computer for transferring, recording, analyzing and/or displaying the results of each ECL assay. Which is viewed to be inclusive of instant claim 8. (page 25).

Signals arising from a given binding domain can have a range of values, and these values correlate with quantitative measurement to provide an `analog` signal. In another technique a `digital` signal is obtained from each domain to indicate that an analyte is either present or not present. (page 16).

Oligonucleotides bound to an electrode surface can be utilized as a binding agent in a binding domain. (page 21).

A series of voltage waveforms is applied so as to generate a multiplicity of ECL signals. Further, multiple electronic potential waveform pulses may be utilized to reduce undesirable modulation of signal due to non-specific binding. Electronic potential may be applied to prevent non-specific binding of certain charged species. Additionally, electronic potential may be applied so as to promote the localization near a binding domain(s) of certain analytes or chemical species of interest. The voltage waveform applied supplies large over-potential (e.g., higher potential than is required to generate ECL). Over-potentials may be utilized to modulate ECL signals in a voltage wave series or in a single voltage wave pulse. (page 22).

Measurements of ECL at different binding domains can be done sequentially or simultaneously. Which is viewed to be inclusive of instant claim 5. (page 27).

The formation of PMAMS on the surface of a composite electrode can be achieved by a variety of methods including photolithographic immobilization, microcontact printing and/or the controlled application of drops of binding reagents to the surface through the use of microcapillary arrays or ink-jet printing. Which is viewed to be inclusive of instant claim 2. (page 27).

In continuous or intermittent ECL measurements, the rate of a binding reaction is measured continuously or at intermittent intervals. An advantage of continuous or intermittent measurements for determining the rate of a binding reaction is that it offers increased sensitivity and precision as compared to single-point ECL measurements. (page 45).

The fabrication of metallic electrode patterns and conductive elements to distribute electrical current to such electrodes on a surface is carried out by methods well known to the art. The preparation of metal films on transparent surfaces is used to produce liquid crystal displays and is readily adapted to the preparation of electrodes according to the invention. (page 20).

A support having a PMAMS may be used for sequencing of nucleic acid strands. For example, a PMAMS with a plurality of binding domains is prepared with different oligonucleotide probes of known nucleotide sequence as the binding reagents in different binding domains. That is, different binding domains will contain binding reagents of different known nucleotide sequence. The oligonucleotide chain or fragments of the oligonucleotide chain to be sequenced are then allowed to bind (hybridize) to the PMAMS binding domains. The nucleic acids to be sequenced are ECL labeled. Binding assays are conducted on the

PMAMS and the distribution of ECL signals from the discrete binding domains on the PMAMS is used to sequence the oligonucleotide chain.(page 27).

The method is based on the ability of short oligonucleotides to hybridize to their complementary or substantially complementary sequence in another nucleic acid molecule. Conditions can be selected such that the desired degree of sequence complementarity is necessary for successful hybridization. Hybridization of a DNA molecule of unknown sequence to a probe of predetermined sequence detects the presence of the complementary sequence in the DNA molecule. The method is preferably practiced such that the hybridization reaction is carried out with the oligonucleotide probes bound to the binding domains and the sample DNA in solution.(page 27).

An assay system 690100 for conducting ECL assays in a disposable cartridge 69090 with an instrument 690101 is illustrated in FIG. 69. Cartridge 69090 includes a base 69091, a diaphragm 69092, a counterelectrode 69093, a reaction enclosure 69094, a sample port 69095, electrical leads 69096, and a reference electrode 69099. Instrument 690100 includes a cartridge receptacle 690108, a light detector and/or imaging device 690102, an electrical connector 690103, a source of electrical energy for applying a voltage or current between the working and counter electrodes 690104; a sonication device 690105; a source of electrical energy 690106 for driving sonication device 690105; and a microprocessor 690107 for instrument control, assay data gathering, and assay data analysis. (page 43).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

9. Claims 13 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wohlstadter et al. (Pub. No.: US 2004/00864233 A1) in view of Griffais et al. (EP 0407291A1).

Wohlstadter et al. is discussed above. However Wohlstadter et al. (do not show single stranded DNA generated from amplified genomic DNA sample digested with exonuclease.

Griffais et al. disclose an improved polymerase chain reaction protocol comprises (1) destroying (e.g., with an exonuclease) the 5' ends of double-

stranded nucleic acid sequences present in the sample, (2) amplification with appropriate primers, and (3) detection of amplified target sequences.

Therefore it would have been obvious at the time the invention was made to use the biosensor of Wohlstadter et al. wherein the nucleic acid segments are hybridized with single strand DNA generated from amplified genomic DNA sample digested with an exonuclease since Wohlstadter et al. state that the analytic of interest maybe, e.g., a whole cell, a subcellular particle, virus, prion, viroid, nucleic acid, protein, antigen, lipoprotein, lipopolysaccharide, lipid, glycoprotein, carbohydrate moiety, cellulose derivative, antibody or fragment thereof, peptide, hormone, pharmacological agent, cell or cellular components, organic compounds, non-biological polymer, synthetic organic molecule, organo-metallic compounds or an inorganic molecule present in the sample. The sample may be derived from, for example, a solid, emulsion, suspension, liquid or gas. Furthermore, the sample may be derived from, for example, body fluids or tissues, water, food, blood, serum, plasma, urine, feces, tissue, saliva, oils, organic solvents or air. The sample may comprise a reducing agent or an oxidizing agent .(page 27). Which is viewed to be inclusive of DNA from an amplified genomic DNA sample digested with exonuclease . Further, amplified DNA with exonuclease avoids amplification of contaminating sequences and false positive results. (Griffais page 3-4). The method of Griffais has the advantage to modify, at the beginning of the reaction, the target fragment amplified during previous manipulations, without important modifications of the

plasmid or genomic DNA in which the target sequence is to be detected. (page 6).

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jezia Riley whose telephone number is 571-272-0786. The examiner can normally be reached on 9:30AM - 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gary Benzion can be reached on 571-272-0782. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Monday, October 18, 2004

JEZIA RILEY
PRIMARY EXAMINER